SEPTEMBER 3, 1990

EMICAL NEERING

NEWS

Erich Bloch

Retirement leaves powerful legacy at NSF

Page 9

CHEMICAL & ENGINEERING
NEWS
SEPTEMBER 3, 1990

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News of the Week

■ **At ACS national meeting in Washington, D.C., top elected officials promise all-out fight against Dialog antitrust suit.** Page 4

■ **OSHA begins new, rigorous petrochemical plant inspection program at large producers, in effort to prevent major catastrophic accidents.** Page 5

■ **Some chemical firms are taking steps to aid families of employees called up for military reserve duty, including extending pay and benefits.** Page 5

■ **Risk assessment and the public's understanding of risk highlighted at presidential plenary session at ACS national meeting.** Page 6

■ **East European scientists outline help needed from West to upgrade their science and technology establishments.** Page 6

■ **ACS's 200th national meeting in Washington, D.C., featured more than 4000 technical papers, hosted over 14,000.** Page 7

■ **Progress reported on several fronts in effort to develop CFC alternatives.** Page 8

Cover: Photo by C&EN's Bette Hileman

Letters 2

Concentrates

Business 13
Government 19
Science/Technology 28

The Departments

New Products 20
Meetings 37
Newscripts 52

Business

Fledgling biotech firm, Celgene, moves closer to market with a major patent and an experienced management team. **Page 14**

Demand for methanol is outpacing supply, largely because of the growing use of gasoline octane enhancer MTBE. **Page 17**

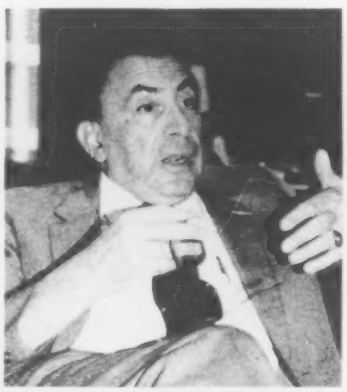
Government

EPA data on hazardous chemicals emissions are attracting more attention from citizen activist groups at state and local levels. **Page 23**

Science/Technology

Catalysis research promises new vitality to a maturing chemical industry. **Page 30**

National Cancer Institute to issue request for proposals for syntheses of potential anticancer agents. **Page 35**



News Focus

Erich Bloch departs his position as director of NSF leaving mixed feelings among both staff and science community and a much-transformed agency in his wake. **Page 9**

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LETTERS

Chemical sensitivity

W. Alfred Mukatis (C&EN, June 4, page 3) characterizes chemical sensitivity as a serious problem and a debilitating illness in his letter. I agree with him, but not for the reasons he states.

"Chemical sensitivity" is a nonspecific illness that the sufferers claim is caused by an initial exposure to one or more chemicals, usually at work, resulting in an as-yet unspecified immune reaction to a variety of subsequent chemical stimuli. The claimants describe a number of vague symptoms that cannot be medically verified (transient loss of memory, numbness, unusual tastes, headache, for example). The sufferers seek treatment from a number of medical personnel, both traditional (MDs, RNs) and nontraditional (clinical ecologists, holistic healers). Nontraditional practitioners routinely prescribe a complete removal from the supposed noxious stimuli, often accompanied by vitamin, herbal, or homeopathic treatments.

In my professional experience, these cases share a number of features that make broad-spectrum chemical sensitivity a very unlikely case:

- The supposed stimulus almost always occurs at work, with a subsequent claim of work-related disability. As chemists we are aware, of course, that chemicals are ubiquitous in the universe, composing all of the materials we encounter in our daily lives (including our own bodies). It strains credibility to imagine that a class of "bad" chemicals found primarily in the workplace is responsible for an illness that can be treated with other "good" chemicals found only in nature (e.g., vitamins, herbal remedies).
- The chemicals claimed to be responsible for the initial "exposure" and the subsequent broad-spectrum sensitivity are almost always odorous organics. Frequent "offenders" are formaldehyde, paints, 4-phenylcyclohexene, gasoline and/or diesel fuels, acetone, and various common pesticides. It is highly suspect that these subjects do not complain of effects from materials that have no odors. Typically the claimant will experience an odor and attribute any subsequent feelings of ill-health to exposure to the odorous material. Naturally odoriferous materials similar in composition to the supposed causative agents (for example, complex pine resins or the scents of live flowers) rarely cause problems.
- The claimants share a distinctive psychological profile. They tend to be anxious, desperate personalities who have learned to use their ill health to manipulate others. Unfortunately, our society stigmatizes persons who admit to psychosocial illness; chemicals happen to be a convenient (and socially acceptable) scapegoat at present.

As I mentioned above, there is a movement (mostly promulgated by clinical ecologists) to legitimatize broad-spectrum chemical sensitivity as a compensable illness under workers' compensation. A great deal of social harm will result from blindly accepting this interpretation. In the majority of cases I have encountered, I believe the subjective symptoms claimed by "chemically sensitive" individuals are real (i.e., they really do feel bad and are not faking). Although I sympathize with the sufferers, I will be very surprised if a generalized immune response to "chemicals" is the cause of their problems. Any success that clinical ecologists have in treating these people is most likely explained by the placebo effects and/or removing most of the stress- and anxiety-producing aspects of the patients' lives, including conventional workplaces. Interested persons should read a recent review on this subject by Abba I. Terr, "Clinical Ecology in the Workplace," in the March 1989 *Journal of Occupational Medicine.*

Carol M. Rubin
Industrial Hygienist
Davis, Calif.

Student-adviser relationships

I am moved to write in support of David B. Morse's letter (C&EN, May 28, page 4) suggesting that negative attitudes among graduate students are largely a result of unhealthy student-adviser relationships.

Although my personal experience at graduate school has been very positive (which I attribute in part to careful selection of research adviser), I am routinely distressed by the inhumane treatment of some of my colleagues. The power of an adviser to influence a student's career is unfortunately often abused.

Abuse of graduate students by their advisers takes a variety of forms. Some students are expected to perform secretarial work. Others continually receive negative reinforcement from their advisers, who fail to take the time to teach them. I have seen some students manipulated by their advisers.

When I ask my colleagues why they put up with these injustices, they tell me they are afraid. They argue it is just for a few years and they can survive. However, a few years of mistreatment can lead to a lifetime of cynicism. I am most dis-

Growth in methanol supply lags demand

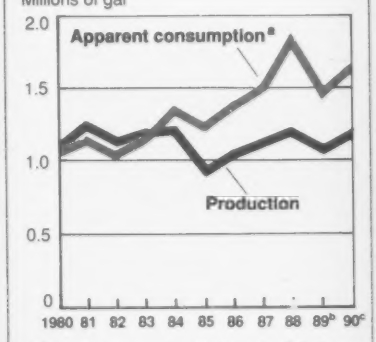
Worldwide methanol demand is rising faster than production capacity, resulting in improved operating rates. Continued improvement is forecast for the near future since few capacity expansions are scheduled for completion in the next three years. Spurring the growing demand is methyl *tert*-butyl ether, used in gasoline as an aid to lower exhaust pollutants.

A more than 10% increase forecast for methanol demand for MTBE in 1990 and a 21% increase in 1991 will result in plant operating rates in 1992 of about 85% of nameplate capacity, up from about 78% in 1989. Consumption of methanol in making formaldehyde, acetic acid, and other chemicals will grow much slower than its use in making MTBE.

Global demand for methanol will grow more than 18% between 1989 and 1992, but capacity will increase less than 9%, according to James J. Crocco, whose Houston-based consulting firm, Crocco & Associates, has released a new study on the international methanol situation. Counting this year's conversion of a plant in New Zealand from fuel-grade methanol to chemical grade, two small plants to be built in the U.S., and a world-scale plant in Saudi Arabia, capacity worldwide will reach more than 8 billion gal in 1992, Crocco says. Global demand is forecast to be 6.8 billion gal in 1992. MTBE demand for methanol will triple to 1.2 billion gal in 1992, up from 400 million gal in 1989, accounting for much of the methanol demand increase.

Plans to expand methanol capacity face financial limitations because of current low rates of return on methanol sales. U.S. spot prices for methanol are less than 30 cents per gal, with contract prices slightly above 30 cents and posted prices 37 to 40 cents per gal. Although influenced by shipping and storage costs, prices in other parts of the world are similar. In addition to return on investment, feedstock and energy costs are a large component of selling price. Consequently, most of the methanol expansions during the 1980s were located where natural gas costs were low. During the mid-

U.S. methanol consumption far outstrips production



a Production plus imports minus exports. b Preliminary. c Forecast. **Sources:** U.S. International Trade Commission, Department of Commerce, C&EN estimates

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1980s, several U.S. methanol plants were shut down because of low returns; in the late 1980s most were restarted.

Investment in new methanol facilities will only be made when the rising utilization rates push market prices to levels that make economic sense. However, because two to four years are needed to finance, engineer, and construct world-scale methanol plants (often in locations with little infrastructure), a serious tightness in suppiy could occur in the mid-1990s, Crocco says.

In 1984, U.S. methanol consumers became partly dependent on imports when several plants were shut down as falling prices made them unprofitable. Because consumption has grown faster than capacity, roughly a quarter of the U.S. supply now stems from the excess of imports over exports. With future U.S. energy costs increasing, the cost of making methanol will increase. Consequently, investment returns for U.S. plants could remain less competitive than foreign plants that continue using low-cost gas.

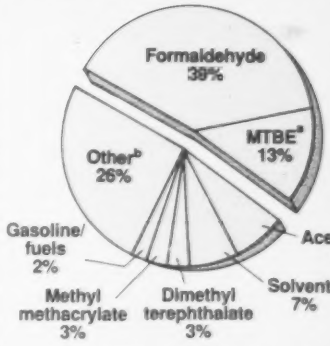
Shifts of methanol from other uses to MTBE could occur, Crocco says. He cites the example of formaldehyde, which consumes more than a third of world methanol output. In the U.S., a slowdown in home building is reducing growth in the demand for formaldehyde for making adhesive resins used in plywood and particleboard.

As phasedown of the use of lead alkyls in gasoline continues worldwide, growth in MTBE use will remain high. MTBE consumption also will continue to increase in the U.S. as the potential remains for its greater use in reformulated gasolines needed to meet future clean air regulations.

MTBE growth could temporarily be slowed by the limited supply of isobutylene. However, numerous petroleum refinery projects are under way or have been planned to increase isobutylene output. If a large part of these projects is completed, and methanol capacity grows slowly, the limit on MTBE supply in the mid-1990s could be methanol, not isobutylene, Crocco suggests.

Bruce Greek

Formaldehyde, MTBE make up half of global methanol use



1990 global methanol consumption[c] = 6.1 billion gal

a Methyl *tert*-butyl ether. b Largely as intermediate for chemical manufacture. c Forecast. **Source:** Crocco & Associates

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